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PROBLEMS ASSOCIATED WITH THE PHARMACOLOGY AND CLINICAL USAGE OF CURARE*

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The introduction of curare into clinical anaesthesia in 1942, whilst facilitating some procedures and difficulties, has at the same time raised many problems, pharmacological, physiological and clinical. The intelligent use of curare, if it is to be of any benefit to the patient during an operation, makes demands on one's knowledge of the basic sciences and requires meticulous attention to many previously ignored signs of anaesthesia.

It has become clear that, for the most part, the conduct of general anaesthesia cannot be regarded as a well designed series of 'depths' or 'planes', but is the control or recognition of certain reflexes produced by the agent, by surgical trauma, or the results of opening certain body cavities or handling various viscera.

Claude Bernard's concept of curare action, whilst clear and simple seems only partly to be true. There would appear to be certain central actions with ordinary clinical dosage. This is important, as more conclusive work in this direction may clearly demonstrate whether curare potentiates the action of a given agent, or acts merely by obtunding the efferent or motor side of a reflex response. A study of the pharmacological actions of curare together with a closer knowledge of certain reflex phenomena will help a great deal in understanding some of the problems presented.

PHARMACOLOGY

In the past the study of the actions of curare has been rendered difficult and confusing by the use of curare solutions of varying constitution and by confusion of many of the signs and effects of anoxia with those of curare.

NEUROMYAL JUNCTION

Lack of time or space precludes discussion of activity at the neuromuscular junction. For further details the reader is referred to Kuffler's and Acheson's articles. Since the discovery of the junctional potential at the end-plate (e.p.p.) it has become clear that this represents an intermediary process between the nerve and muscle impulse. It seems that e.p.p. sets up a muscle

impulse by depolarising muscle membrane. The difficulty is not how the muscle impulse is set up, but how the e.p.p. is activated by the nerve. To explain this latter effect there are two theories the so-called 'electrical', and 'chemical'. The chemical theory of 'Transmitter' holds the field at present.

The Action of Curare at the Neuromuscular Junction. It is known that curare does not alter the action potentials of nerves. Secondly it does not appear to affect the output of transmitter. Thirdly, while with large doses of curare the electrical excitability of muscle is decreased, the failure to respond to indirect stimulation does not depend on this factor. It would appear, therefore, that curare acts on the end-plate mechanism. The fundamental change appears to be that, with curare, a decrease of e.p.p. occurs and depolarisation is not effected. Curare appears to act by increasing the threshold of the receptor to the transmitter.

Action of Curare on other Junctional Tissues. It has been known for a considerable time that curare can block autonomic ganglia. Clear blocking effects on the cervical ganglia can be demonstrated and it appears that these blocking effects can occur with minimal curarising doses. How far the results of animal experimentation can be applied to man is at present not clear. The difficulty of investigating post-ganglionic synaptic behaviour in the heart and smooth muscle is that junctional potentials are usually swamped by propagating impulses in the surrounding tissues.

Vagus. Mautner and Luisada, using crude curare, claim that it causes vagal paralysis. McIntyre, however, has shown that with purified d-tubocurarine chloride (DTC) little effect is demonstrable.

CURARE AND THE CENTRAL NERVOUS SYSTEM

Numerous reports, both clinical and experimental, suggest a central action. One factor stands out clearly, and that is that many of the actions previously ascribed to curare were anoxic phenomena.

Direct application of curare, including purified DTC causes convulsions in the experimental animal. Further, Berry and Forster showed direct application of DTC causes increased electro-encephalographic activity.

* This paper was read at the Medical Congress of the Association held at Cape Town in September 1949.

McCawley and Belford, using cats, with constant ventilation, showed that doses, insufficient to cause intercostal paralysis, can produce clonic movements and E.E.G. changes resembling *grand-mal* attacks; and that these phenomena are prevented by thiopentone, pentobarbital and morphine. They demonstrate further, that increasing doses suppressed electrical activity—which action was irreversible, despite the fact that ventilation was continued for 20 hours. Physostigmine or prostigmine did not aid recovery. Cohnberg also reports DTC having convulsant properties and demonstrated their prevention by CNS depressants—the latter which also augmented the peripheral curare effect. Everett (using the cat), however, failed to demonstrate any significant E.E.G. changes. McIntyre reports that in dogs, with minimal curarising doses, there is first an increase and then a decrease of E.E.G. activity. In connection with reports of increased activity it is interesting to note that Feitelberg and Pick report brain temperature changes suggestive of increased oxidation when curare was administered during light narcosis—but with deep narcosis there was no temperature change. In addition Featherstone and Gross suggest that muscle and brain oxidation may be increased during curarisation. Pick and Unna reported DTC caused suppression of electrical activity in frog's brain and that the central depression lasted longer than the neuromuscular dysfunction. Prostigmine, whilst decurarisising peripherally, potentiated the central effect. This state of affairs is suggestively similar to that reported by West—whose frogs lay about, but moved and jumped when stimulated.

So far as the writer is aware little or no work has been carried out on humans, concerning the effect of curare on brain potentials.

West in 1935 remarked that there appeared to be central effects caused by DTC, his patients complaining of dizziness, nausea and disordered sensation. Denhoff and Bradley using curare on spastic children, report 'lightness' and 'happiness' for two days following injection. Many of the patients were lethargic for 24 hours following the injection. Whitacre and Fisher report that curare in adequate dosage will produce general anaesthesia. Smith and his associates, and Prescott *et al.* report on the absence of cerebral effects following the administration of DTC. It must be noted that in each of the latter reports the injections were made slowly. The author has himself seen unconsciousness develop rapidly—within 20 seconds of a large dose 25 mg. of DTC—rather suggesting a central action. In addition it is not uncommon to find patients complaining of dizziness or sleepiness after a test dose of 5 mg. of DTC. At the same time no blood pressure fall or pulse changes were detectable which would suggest a cardiovascular basis. A factor which seems to play some part, is the rate of injection, for both in experimental and clinical work this seems to cause the more profound effects—centrally.

SYNERGISM

Closely bound up with the question of central effect is that of synergism of DTC with narcotic drugs. There seems little doubt that the majority of anaesthetic drugs,

and morphine can potentiate the motor effects of curare. Halton and Gray in their papers postulate a synergistic effect between curare and thiopentone. Pick and Richards have developed this theme on a quantitative basis and have demonstrated, in animals under pentobarbital and ether narcosis, that $\frac{1}{2}$ – $\frac{1}{10}$ of a sub-effective dose will produce apnoea.

Kimura and Unna have demonstrated similar effects with thiopentone. Schmidt and Chase suggest a peripheral synergistic effect between increased muscular activity and curare, i.e., following intense muscular activity the effective curarising dose is much less. This may be of importance following stormy inductions, in that an average dose may cause a profound effect. In clinical anaesthesia it is very clear that deep narcosis and curare potentiate each other's effects. Not only will a small dose of curare produce excessive neuromuscular block, but also the cardiovascular disturbances associated with profound anaesthesia, severe blood pressure fall and a tendency to develop shock, rapidly ensue.

EFFECTS ON CIRCULATION

The greatest confusion seems to exist concerning the effects both on the heart and the peripheral vascular system. In many cases confusion has been caused by the failure to differentiate between the effects of anoxia and those due to curare *per se*. Again little attention has been paid to the rate of dosage. Nor in the cases in which artificial ventilation was carried out, has much attention been paid to the possible effects, on cardiac output, of the act of ventilation. The following factors appear to be established. In the human and the majority of experimental animals, curarisation can occur with little or no manifestation of haemodynamic disturbance—provided anoxia is avoided. The rapid intravenous injection of large doses may lead to cardiovascular collapse—the mechanism of this is not clear. In ordinary clinical work, provided anaesthesia is not deep, or shock not imminent, injection, even of relatively large doses, appears to cause little cardiovascular disturbance. In the presence of declared shock the administration has no detectable effect on the syndrome.

It is interesting to note that curare appears to cause a well-marked postural hypotension with active carotid sinus response (West). This might be due to ganglionic blockade, but it is not clear at present whether curare has a direct effect on the vessels.

EFFECTS ON RESPIRATORY MECHANISM

In general the effects have usually been regarded as being due to peripheral neuromuscular block. This seems to have been an over-simplification of the problem. As previously noted there appears to be a central inhibition. In dogs it has been found that bronchospasm appears with DTC. It is, in many cases, not possible to maintain adequate ventilation unless intermittent positive pressure is used. Even Drinker respirators modified for dogs have proved inadequate. In man there is no doubt that bronchospasm does occur, but the grosser types are not common. Dripps and Comroe estimate it occurs on 0.3% of cases receiving DTC. The author has had experience of two severe cases.

ANTAGONISM TO CURARE

There are many antagonists to curare action—the majority being cholinesterase inhibitors. The most effective at the present time appears to be prostigmin methylsulphate. Decurarisation with prostigmine seems to occur in this manner: There is a growth in duration and amplitude of the e.p.p. which, previously inadequate, becomes adequate and transmission is re-established.

An unfortunate feature is that the effect of prostigmine is limited—newer anti-cholinesterases may be more helpful.

THE USE OF CURARE IN CLINICAL ANAESTHESIA

The question inevitably arises—why use curare? Relaxation can be obtained by other means. For instance the patient can be saturated with ether almost to a state of complete apnoea—to the complete, immediate satisfaction of the surgeon. No doubt this is what is called a 'good anaesthetic'. What are the consequences? The majority of anaesthetic agents produce histotoxic anoxia, all will produce anoxic anoxia if the respiration is shallow. By the same token, with a depressed respiration a gradual build-up of the blood carbon dioxide tension ensues which may not declare itself till the post-operative period—by producing a severe shock-like syndrome. Prolonged nausea and emesis are almost a *sine qua non*. Alternatively regional analgesia, with its blood pressure fall and with depressed respiratory activity (due to heavy premedication and intercostal paralysis) causes anoxic anoxia and hypercarbia.

Taken by and large, all anaesthetic drugs are poisons, and no anaesthetic can ever be claimed directly to have benefited a patient. With this in view it should be the anaesthetist's aim to use a minimum of toxic drugs for narcosis, and obliterate motor activity by peripheral block—as far as possible. At present the most satisfactory answer to this problem is the coincident use of light narcosis with d-tubocurarine—added to which is the adequate supplementation, if necessary, of respiration, to ensure oxygenation and elimination of CO_2 .

In the average case it probably makes no difference what agent is used, provided light narcosis is maintained, and the anaesthetist pays due regard to the pharmacological effects and limitations of each agent, whether it be thiopentone, ether, nitrous oxide or cyclopropane.

An argument is frequently proffered that curare may, and frequently does, abolish one of the 'cardinal' signs of anaesthesia—the respiration. It has become increasingly clear, on using non-irritating agents that respiratory activity is sometimes no guide, and indeed, the surgeon's knife is the final arbiter as to the presence of surgical anaesthesia. Further, certain reflexes may lag behind the usual signs in a most deceptive manner. As Orton points out, one might assert that it is unjustifiable to cover the head of a patient undergoing a neurosurgical procedure—as one cannot see the eyes.

Again it should be emphasised that one should aim at understanding, controlling, or abolishing the various reflexes set up by anaesthesia and by the surgeon's manipulations.

SIGNS OF ANAESTHESIA IN THE CURARISED SUBJECT

When Guedel did anaesthesia a great service in defining certain planes or depths of narcosis, the profession pounced on the respiratory signs described, as these were the easiest to understand and observe. Unfortunately the reflexes described were to a great extent ignored. Articles by Gillespie, Mushin and McCann revived interest in this subject.

It is necessary in the curarised patient to observe the whole organism and its activity. The various factors and signs to be observed will be considered *seriatim*.

The fundamental observation of surgical anaesthesia is that the patient remains immobile during trauma of moderate intensity. Even in the presence of full curarisation, if surgical anaesthesia is not present, some reflex activity to intense stimuli will be noted, an arm or a finger may move, a frown may appear, or the facial muscles may contort.

The presence or absence of reflexes naturally depends on the depth of anaesthesia. The appearance of a given reflex is not necessarily of any serious import, but the activity is merely indicative of the depth or lightness of narcosis.

The Eyes. During the second stage of anaesthesia pupillary dilatation may occur—particularly on the application of trauma. The light reflex is brisk. A dilated pupil with sluggish light reflex indicates either anoxia or deep anaesthesia. Secretion of tears is usually abundant during light anaesthesia and this may be a valuable sign.

Respiration. Generally there is a pause between each phase of the respiratory cycle—this is generally regarded as indicative of diaphragmatic respiration. In the presence of intercostal paralysis tracheal tug is often noted—this movement has variously been associated with hypercarbia, anoxia, or bronchospasm—whatever the cause, the treatment is surely, in every case, not only the same, but mandatory, i.e., assistance of respiration by intermittent bag pressure. One would not be erring much on the side of conscientiousness if one insisted that in every case, in which normal respiratory mechanism were abolished, i.e., in which intercostal activity was poor or absent, assistance of respiration should be carried out. It requires very enthusiastic hyperventilation to produce acapnia.

Surgical stimuli in the zones supplied by the thoracic segments generally result in increased activity of the expiratory phase, in addition to which there seems to be a bronchial reaction. This phenomenon is familiar to all of us—if the peritoneum is manipulated or visceral traction applied during light anaesthesia, gut is forced out of the abdomen and usually a glottic reaction of the grunting type occurs as well. With curare the motor component of the reaction is not seen, but disturbances of rhythm and rate of respiration are common. Traction on the gall-bladder almost invariably causes expiratory apnoea and it will be found difficult to inflate the lungs while the stimulus is applied. As soon as the stimulus is removed respiratory activity, if present, is resumed and it will immediately be found more easy to inflate the lungs if controlled or passive respiration is being used. Similar reflex disturbance is seen with traction on most abdominal viscera. Occasion-

ally traction on the stomach during gastrectomy causes augmentation in both depth and rate of respiration. Traction on the female adnexa very commonly causes an increase in the rate.

Intimately associated with respiratory activity is glottic activity—the so-called Brewer-Luckhardt reflex—(reflex inspiratory closure) and the grunting reflex of Guedel (glottic closure on expiration). It will be found that these reflexes still occur in the curarised patient if the degree of stimulus is great—for instance, if during a lower abdominal operation the surgeon suddenly decides to explore the gall-bladder region, reflex closure may occur and then persist in a partial form, despite apparently adequate curarisations. Deepening the degree of narcosis often suffices to abolish laryngeal activity.

The Re-breathing Bag. In many cases the degree of suppression of respiratory reflexes can be assessed by the ease or otherwise with which the lungs are inflated—one may be misled, however, if there are no surgical stimuli at the moment of compressing the bag. Not infrequently, if intense stimuli are applied in the thoracic segmental zone, it will be noted that the bag suddenly fills (due to an expiratory response) and may take a considerable time to subside to its former level. It is well at this stage to take cognisance of several matters concerning the re-breathing bag—compressing against a manometer, it will be found much easier to build up a high pressure with an almost empty bag than a full one. It is thus far easier to apply excessive pressures if the bag is only partially full.

PULSE AND BLOOD PRESSURE CHANGES

Blood Pressure. Hypertension may be due to one of several factors:

- The normal pressor response seen under light anaesthesia does not appear to be abolished by curare.
- It may occur as a transient phenomenon if the degree of pain stimulus is greater than the existing degree of narcosis—such as, during intense traction on a stomach, the patient may react by contorting the facial muscles, hyperventilating and developing transient hypertension—whereas the degree of narcosis previously appeared to be adequate. The usual response however, to visceral traction is hypotensive.
- Hypercarbia—it will sometimes be found that assisting an apparently adequate respiration results in the fall of a previously elevated blood pressure.
- The anaesthetic agent—it seems that occasionally cyclopropane causes a pressor response. This was well seen in one case requiring two separate abdominal operations. At the first cyclopropane and curare was used and the blood pressure rose from 120/80 to 200/160 and despite changing of soda lime, absorbers, hyperventilation, and deepening narcosis, the hypertension persisted. At the second operation anaesthesia was again induced with cyclopropane and hypertension again developed. On changing to ether—in a closed circuit—the blood pressure fell to normal levels.

Hypotension. This may be due to:

- Shock—the treatment is obvious.
- Rapid injection of large doses of curare in the

presence of deep anaesthesia not infrequently results in a fall of blood pressure.

3. Inadequate anaesthesia and excessive visceral stimuli—the usual reaction is a fall in blood pressure.

4. Deep anaesthesia by its effects on the cardiovascular system may be associated with hypotension.

5. Anaesthetic Agent. Thiopentone, particularly in hypertensives, may cause a fall of blood pressure.

Pulse. Slow. A slow pulse is not infrequently seen in cyclopropane anaesthesia—particularly if the narcosis is unnecessarily deep. This may give rise to a false feeling of security until the anaesthesia has been terminated—when a rapid rate and fall of blood pressure indicate that all is, indeed, not as well as it seemed.

Rapid. 1. This may be due to excessive atropine—especially if the latter has been administered intravenously.

2. Frequently when the degree of narcosis is too light a rapid pulse develops—this sign, in the absence of shock, is valuable.

3. Shock—tachycardia is usually the one of the earliest signs.

CONCLUSION

In conclusion one would like to sound a note of warning to the most important contra-indication to the use of curare—the inability to maintain an adequate airway. This does not only indicate ability to cope with a supralaryngeal obstruction but it is clear that obstruction to aeration can under certain circumstances occur in the lower respiratory tract too. For this reason the author had been diffident about using curare in asthmatics and similar cases.

Whilst curare has been recommended as a valuable adjuvant in carrying out laryngoscopy and endotracheal intubation, it does not mean that in all cases this procedure will be rendered supremely easy. There are still cases with protruding upper teeth, underslung jaws, and other abnormalities which make exposure of the glottis impossible. Cases with inflammatory or neoplastic processes round the pharynx, larynx, or trachea are no more easy to manage with curare than without. It is still safer in some cases to ensure an adequate airway under local anaesthesia prior to adding the compromising factors of apnoea and narcosis.

Whilst the beneficial effects of curare and light narcosis may not be clear in the average short case, the results seen in the prolonged and extensive abdominal and thoracic operations now carried out have been very gratifying. There seems little doubt that the intense and unremitting care required in observing the lightly narcotised and curarised patient is well repaid in the decreasing rates of post-operative morbidity and perhaps mortality. On the other hand there can probably be little that is more detrimental to the patient's condition than deep anaesthesia and curarisation. Again it must be emphasised that it is the administrator's ability intelligently to apply known pharmacological and physiological facts to a certain measure of technical skill, which may make the difference between good or bad success or disaster.

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South African Medical Journal

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EDITORIAL

CLINICAL USE OF L-THYROXINE SODIUM

The thyroid gland is possibly the first to which an endocrine function was attributed, and it is perhaps surprising that no substantial alterations in the methods of treating thyroid underfunction have taken place since the introduction of glandular tissue for this purpose some 60 years ago. The first clinical observations relating any pathological condition to the thyroid were made between 1870 and 1880, and were associated with Gull's description of a syndrome of mixed physical and mental symptoms. In his work he described the symptoms associated with what is now known as myxoedema and observed their similarity to those of cretinism, but he did not relate either condition aetiologically to the thyroid gland.

Several years later similar symptoms were observed after surgical removal of the thyroid gland to relieve the physical discomfort and unsightly appearance of goitres. When the clinical and surgical observations were considered, along with information then but recently obtained about the effects of thyroidectomy in animals and the relief of these symptoms by grafting experiments, it became apparent that the thyroid was much more important physiologically than had been thought. In 1891 injection of thyroid extracts was first used by Murray for the treatment of myxoedema, with very satisfactory results; and in 1892 his observations were confirmed and taken further by the successful use of fresh gland administered orally. Later on, treatment by oral administration of tablets composed of dried thyroid was introduced, and this remains the basis of present-day thyroid therapy.

Thirty years later the brilliant work of Sir Charles Harington, in determining the constitution and effecting the synthesis of thyroxine, opened the way for the use of the pure hormone in medical practice, and made possible clinical treatment with accurately known doses of a pure substance instead of with the more variable dosage inevitable when a crude preparation of a natural tissue is employed. This variability in dose is still encountered in spite of many efforts to standardize the preparations by both chemical and biological methods. Early work on the use of synthetic thyroxine, however, proved disappointing, as it was said to be irregularly absorbed and to lead to unreliable physiological responses.

VAN DIE REDAKSIE

KLINIESE GEBRUIK VAN NATRIUM-L-TIROKSIEN

Die skildklier is moontlik die eerste klier waaraan 'n endokriene funksie toegeskryf is en dit is miskien verbasend dat daar sedert klierweefsel ongeveer 60 jaar gelede vir die eerste keer vir hierdie doel aangewend is, geen ingrypende verandering was in die behandelingsmetodes van skildkliergebrek nie. Die eerste kliniese waarnemings wat enige patologiese toestand met die skildklier in verband gebring het, is tussen 1870 en 1880 gedoen en is verbind met Cull se beskrywing van 'n sindroom van gemengde fisiese en geestelike simptome. In sy werk het hy die simptome beskryf wat verbind word met wat nou as miksedeem bekend staan, en het hy die ooreenkoms daarvan met dié van kretinisme opgemerk maar hy het geen van die twee toestande etiologies met die skildklier in verband gebring nie.

Verskeie jare later is soortgelyke simptome waargeneem na die verwydering van die skildklier om die fisiese ongemak en die afsigtelike voorkoms van skildkliergeswelle te verlig. Toe die kliniese en snykundige waarnemings saam met inligting oorweeg is wat toe pas verkry is in verband met die verwydering van die skildklier by diere en die verligting van hierdie simptome deur oorentingsproefnemings, het dit duidelik geword dat die skildklier fisiologies baie belangriker was as wat eers gemeen is. In 1891 het Murray vir die eerste keer die inspuiting van skildklieraftreksels met uiters bevredigende resultate vir die behandeling van miksedeem gebruik; en in 1892 is sy waarnemings bevestig en verder gevoer deur die geslaagde gebruik van die vars klier wat deur die mond toegedien is. Later is die behandeling met tablette van gedroogde skildklier wat deur die mond toegedien word vir die eerste keer toegepas en dit bly die grondslag van die huidige genesende behandeling van skildkliergevalle.

Dertig jaar later het die skitterende werk van sir Charles Harington in verband met die bepaling van die samestelling van tiroksien en die verkryging van die sintese daarvan, die weg vir die gebruik van die suiwer hormoon in die geneeskundige praktyk oopgestel, en het dit kliniese behandeling met presies bekende dosisse van die suiwer stof moontlik gemaak in plaas van behandeling deur die toediening van veranderlike dosisse wat onvermydelik is wanneer 'n onsuiver paraat van natuurlike weefsel gebruik word. Hierdie veranderlikheid in dosisse word nog altyd aangetref, ten spyte van die veelvuldige pogings om die preparate deur beide skeikundige en biologiese metodes te standaardiseer. Vroeër werk in verband met die gebruik van sintetiese tiroksien was egter teleurstellend aangesien dit na bewering onreëlmatig geabsorbeer is en dit tot onbetroubare fisiologiese reaksies gelei het.

More recently the whole problem has been re-opened both chemically and clinically, and a fresh attack on the synthesis of thyroxine has resulted in a method whereby the pure, natural, laevorotatory hormone can be obtained directly (Fig. 1). Clinical work with this

Kortër gelede is die hele kwessie weer beide skeikundig en klinies heropen en 'n nuwe poging om tiroksien sinteties te vervaardig het 'n metode tot gevolg gehad waarvolgens die suiwer, natuurlike, linksdraaiende hormone regstreeks verkry kon word.

Synthesis of L Thyroxine: Sintese van L Tiroksien

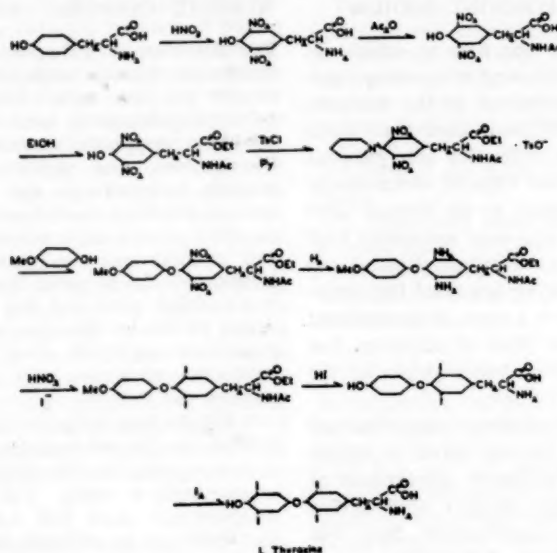


Fig. 1

material was undertaken, since it has never before been extensively tested, all previous work having been carried out on the *DL* optically inactive mixture of enantiomers. So far¹, only a limited number of cases has been treated with *L*-thyroxine, either as such or in the form of its sodium salt; but the results, even in the present preliminary stages, seem to be encouraging. Far from being inadequately absorbed, the new preparations were occasionally found to cause generalized muscular pain which was attributed to ischaemia, due to an all too rapid rise in the basal metabolic rate. This difficulty was readily overcome by the use, initially, of small doses.

Eight patients were satisfactorily maintained on *L*-thyroxine sodium in tablet form, given orally in daily doses of 0.15 to 0.3 mg. As a matter of interest it may be noted that this dose level is quite comparable with that of crude, dried thyroid preparations, since 0.1 mg. of *L*-thyroxine sodium is equivalent to one grain of dried thyroid standardized according to the B.P. or U.S.P. to contain 0.1% of iodine in combination as thyroxine.

1. Hart, F. D. and MacLagan, N. F. (1950): Brit. Med. J., 1, 512

Kliniese werk is met hierdie materiaal onderneem aangesien dit nog nooit tevore op uitgebreide wyse op die proef gestel is nie weens die feit dat alle vorige werk uitgevoer is op die mengsel van enantiomere wat regs- of linksdraaiend vir die oog onaktief is. Tot dusver¹ is slegs 'n beperkte aantal gevalle met *L*-tiroksien behandel, of as sodanig of in die vorm van sy natriumsout; maar die uitslae, selfs in die voorlopige stadiums, lyk bemoedigend. Die nuwe preparate is geensins ontoereikend geabsorbeer nie en daar is selfs gevind dat hulle algemene spierpyne veroorsaak wat aan plaaslike bloedloosheid weens 'n te vinnige basale metabolisme skaal toegeskryf is. Hierdie moeilikheid is maklik te bowe gekom deur die aanvanklike gebruik van klein dosisse.

Agt pasiënte het op bevredigende wyse volgehoe behandeling met natrium-*L*-tiroksien in tabletvorm ontvang, deur die mond in daaglikse dosisse van 0.15 tot 0.3 mg. toegedien. Dit is interessant om daarop te let dat hierdie dosispeil heeltemal vergelykbaar is met onsuiwer preparate van gedroogde skildklier aangesien 0.1 mg. van natrium-*L*-tiroksien gelyk staan aan een grein gedroogde skildklier volgens die Britse Farmakopeia of die Farmakopeie van die Verenigde State gestandaardiseer om 0.1% jodium in verbinding as tiroksien te bevat.

1. F. D. Hart en N. F. MacLagan (1950): Brit. Med. J., 1, 512.

Both subjective and objective improvement took place fairly rapidly after treatment was begun, and the degree of improvement was controlled and recorded by frequent measurement of the B.M.R. and serum cholesterol. Apart from occasional muscular pains mentioned above and due to initial over-dosage in one or two of the earliest cases, the improvement was steady and uncomplicated by side reaction or by erratic and unreliable effects of the drug.

The present information suggests that *L*-thyroxine sodium is satisfactory in every way for the treatment of hypothyroidism and has the advantage over crude preparations of employing a pure natural hormone with which an accurate and reproducible dose can be used.

Beide subjektiewe en objektiewe verbetering het taamlik vinnig ingetree nadat die behandeling begin is en die graad van verbetering is beheer en aangeteken deur die herhaalde meting van die basale metabolismiese skaal en serum cholesterol. Afgesien van spierpyne nou en dan soos hierbo genoem, wat daaraan te wyte is dat aanvanklik in een of twee van die vroegste gevalle te groot dosisse toegedien is, was die verbetering bestendig sonder dat sydelingse reaksies of die wisselende en onbetroubare uitwerking van die geneesmiddel enige bykomende siekteverskynsels veroorsaak het.

Die huidige inligting dui daarop dat natrium-*L*-tirosien in elke opsig bevredigend vir die behandeling van skildkliergebrek is en dat dit die voordeel bo onsuiwer preparate het dat dit gebruik maak van 'n suiwer natuurlike hormoon waarmee 'n juiste en herhaalbare dosis gebruik kan word.

TRACHOMA IN THE SOUTH AFRICAN BANTU*

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One still finds in reputable text-books the statement that 'trachoma is uncommon among negroes'. The purpose of this paper is to correct that impression and to suggest that trachoma in the Bantu, as in the West African negro, is of the papillary and not the follicular type.

Previous Reports. Papers on trachoma in West African negroes have been summarised by Scott (1945). In East Africa the disease has been studied by Stones (1936) and Reed (1945). In South Africa, the National Council for the Blind have organised surveys. Details are given in the appendix and it is all too clear that trachoma is far from being uncommon among negroes.

Author's Cases. At an eye clinic for Bantus at Germiston Hospital, the everted lids, cornea and limbus were examined by naked eye and by slit-lamp microscopy as a routine in 300 consecutive cases. Thirty had trachoma, of whom eight had visual impairment from the disease. Trachoma was of the papillary type. Follicles were noted in only two cases. A red velvety hypertrophied palpebral conjunctiva or scarring with entropion and trichiasis pointed to the diagnosis in all but six cases. The diagnosis was confirmed by pannus found on slit-lamp examination.



The normal limbus in the Bantu is delimited by a band of pigment usually 1 mm. broad (see above).

Six cases were found with blood vessels in the clear cornea beyond the limit of pigment without palpebral involvement. In West African negroes a similar picture was seen to result from resolving trachoma and did not improve with riboflavine therapy.

In the absence of ariboflavinosis, of syphilis and of corneal disease, it is considered that such vascularity confined to the upper limbus is a sign of trachoma.

APPENDIX

Place.	West Africa. Incidence.	Author.
Gambia.	5% Schools. 10% Soldiers. 25% Village.	Scott. Scott. Scott.
Sierra Leone.	68% Conjunctivitis.	Robertson.
Gold Coast.	10% Soldiers.	Scott.
Nigeria.	10% Soldiers.	Scott.
Lagos.	33% Conjunctivitis.	Dodds.
Cameroons.	2% Soldiers.	Scott.
French Colonies.	'Many Cases'.	Marque.
Lake Chad.	10% Soldiers.	Motais.
Mopti.	33% Schools.	Motais.
<i>East Africa.</i>		
Native Soldiers.	'Not uncommon'.	Dansie-Browning.
Kenya.		
Nairobi.	12-17% Eye Clinic.	Harley Mason.
<i>Uganda.</i>		
Budo.	14% Schools.	Stones.
Gyaza.	35% Schools.	Stones.
Buloba.	15% Schools.	Stones.
In Bush.	13% Schools.	Stones.
Mulago.	66% Eye Clinic.	Stones.
Budanda.	30% of Blind.	Boase.
Mwanza.	21.5% Eye Cases.	Reed.
Masailand.	'Common'.	Wilson.
Lindi.	23% Recruits.	McDonald.
Kampala.	'Commonest Entity' at Eye Clinic.	Loewenthal.
<i>Tanganyika.</i>		
Highlands.	50% of Population.	Reed.
<i>South Africa.</i>		
<i>Transvaal.</i>		
Pietersburg.	22% Survey Cases.	National.
Louis Trichardt.	23% Survey Cases.	Council.
Letaba.	8% Survey Cases.	for the Blind.
Potgietersrust.	42% Survey Cases.	
<i>Cape.</i>		
Kimberley.	16% Survey Cases.	Council for the Blind.

* This paper was read at the Medical Congress of the Association held at Cape Town in September 1949.

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OBSERVATIONS ON THE PROETZ DISPLACEMENT THERAPY IN SINUSITIS

A DEMONSTRATION OF THE TECHNIQUE*

D. J. ROUX, M.A., M.B., B.Ch., (DUBL.), M.D., (AMST.).†

In 1926 the original contributions dealing with displacement in the diagnosis and treatment of sinusitis were made almost simultaneously by Proetz and Frazer, independently of each other. This was the first attempt at introducing fluids into all the nasal sinuses simultaneously. Lipiodol was first used and the X-rays conclusively demonstrated the opaque medium in the sinuses of the living subject as well as in a cadaver. The technique today is essentially the same, although a lot has been written since this event. The method has become quite popular, because it is simple to carry out and very effective in properly selected cases.

I am confining this paper to treatment only, and not to the diagnostic side. Whether the use of radio-opaque substances adds anything to a radiograph or not has been discussed far and wide. The consensus of opinion amongst radiologists is that they can get very little additional information through the use of radio-opaque substances by displacement. Also Glaser, Mark, Futch and Snure studied the literature for opinions on the reliability of simple X-ray studies, and found many reports of negative X-ray findings in sinuses which at operation were found to contain pus, and many more which were found to be not diseased in spite of increased density to the rays. I personally do not place much reliance on X-ray plates alone in sinusitis cases, and prefer to base my diagnosis mainly on clinical evidence. Bacteria are always present in normal mucous membranes, but are kept in check by the normal body defences. As far as intrasinus treatment is concerned, it is notoriously difficult to get ordinary nasal douches or sprays to penetrate even normal sinus ostia; much less so in diseased conditions accompanied by oedema of the tissues causing constriction. Proetz reckons one of the chief factors in the prolongation of a sub-acute sinus infection into a chronic one, is the retention of infection and irritating exudates which lie for a long time at the bottom of the sinus, and by their continued presence,

bring about hypertrophies and hyperplasias. The important factor in displacement is the dilution of pus which facilitates its removal, and renders the fluid contained in the sinuses non-irritating. It promotes the essential drainage required to help and enable them to establish their normal function again.

The air in the sinuses can be replaced by suction applied to the nasal cavities, and is replaced by any fluid in contact with the ostium the moment the vacuum is released. Gravity cannot be used in this case, because the ostia are too small to permit the exchange of air and liquid without a certain amount of suction being applied, thereby permitting the penetration of fluids into cavities previously occupied by air.

PHYSIOLOGY

Each sinus communicates with a nasal cavity and therefore with the outer air through a relatively small opening. These openings in the erect posture occur in different positions; the frontal sinus, below, at the most dependable part; the ethmoid, open at the side; the sphenoids, low down in its anterior wall, and the antrum, near the roof. The ostia are normally patent and permit the free exchange of fluids and air. In unobstructed healthy noses, ciliary action effectively empties the sinuses, irrespective of posture. The normal sinus is lined with a low stratified columnar epithelium, completely covered with cilia. The extent and effectiveness of ciliary propulsion are greatly modified by excess of moisture which creates gravity currents flowing over the neutralising ciliary currents. So long as the foreign body is minute in size it can be propelled down toward the ostium by the cilia. Once the infection sets in, however, and exudation occurs, the cilia fail to cope with the situation and permit the bacteria to invade the tissues. Mucous glands are less numerous in the membranes lining the sinuses than in the nose. The film of mucus covering the healthy sinus wall is extremely thin; just sufficient to maintain physiological ciliary activity. Application of constrictors, such as ephedrine, to the neighbourhood of the ostium, usually opens it, and facilitates the introduction of fluids. The important factor in displacement is the dilution of

* This paper was read at the Medical Congress of the Association held at Cape Town in September 1949.

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pus which facilitates its removal, simple cleansing of the mucosa, to loosen old stagnant secretions, and to render the sinus contents more fluid.

Treatment. In treatment the restoration of physiological function is the aim. Remove conditions hindering the absorption of toxins and the production of pain. This means removal of infection and establishment of ventilation and drainage, as infection readily ensues when these are impaired. Old hyperplastic membranes are inactive, and less likely to yield to treatment.

THE DISPLACEMENT TECHNIQUE

The displacement method is accomplished very easily by letting the patient (whose nasal membranes have been previously shrunk with a vasoconstrictor) lie on a table or couch, with a pillow under the shoulders, and the head lowered so that the chin and external auditory meatuses are in the same vertical plane. The patient is told to open his mouth and to keep on breathing, thereby overcoming his desire to hold his breath and to swallow. Several drops of a 1% ephedrine hydrochloride solution are instilled in each nasal chamber. Two to four c.c. of $\frac{1}{2}$ % to 1% ephedrine hydrochloride in normal physiological saline solution are now put into each nostril by means of a 10 c.c. syringe. The fluid should be at body temperature for comfort. Intermittent negative pressure should be applied, to one nostril. A finger closes the other while the patient repeats K-K-K. The intermittent negative pressure is obtained by opening and closing a hole drilled in the side of the tip for the purpose. The suction should be released as soon as a vacuum of 150-180 mm. is obtained, which occurs in a fraction of a second. About one second should elapse before it is re-applied, to permit ample time for the fluid to penetrate the ostium. The process is applied alternately to the nasal passages if both sides are involved. More fluid is instilled into each nostril, and the suction process repeated. A total of 10 to 15 c.c. of fluid is sufficient for most purposes, but more may be required in individual cases. Do not put more than 4 c.c. into one nostril at a time, as the fluid may enter the oropharynx and excite gagging.

The sphenoidal and posterior ethmoidal cells occupy the lowest portions of the nasal chamber. In this position with their ostia upturned, they are very suitable for filling, and receive the greatest proportion of fluid. The anterior ethmoidal cells are usually partially filled. The maxillary ostium is in the inverted position near the most dependant portion of the sinus, so that complete filling cannot take place. Enough fluid gains entrance, however, for therapeutic purposes. Difficulties are often encountered in the frontal sinus. Here the naso-frontal duct is narrow and bubbles of air are not easily displaced from it, and relatively small amounts of fluid gain access.

Precautions. The patient should experience no ill effects following the manipulation. Recurring headaches may be due to the irritating nature of the solution employed, or to excessive negative pressure used. It should never be sufficient to cause pain or epistaxis. Patients with very high blood pressure should not be done. Also avoid irrigation in the earliest stages of acute nasal disease, and when patient has a temperature,

because of the possibility of disseminating any infection which otherwise might have remained localised. Proetz states that in his long and extensive experience of displacement of sinuses, he does not know of a single instance in which infection has been spread into sterile sinuses during treatment. He believes that by the time displacement was employed the patient's immunity had progressed so that bacterial growth did not occur in the presence of the solutions employed. He also believes that there is no possibility of contaminating the Eustachian tube and middle ear with secretions from the nose, as the lymphoid tissue from the pharyngeal end of the cartilaginous tube prevents air from escaping from the middle ear when suction is applied. As this is essential for the introduction of fluid, no penetration occurs. The filling depends entirely upon the removal of air.

Type of Equipment Used. The operation should have constant negative pressure which can be regulated to approximately 150-180 mm. of mercury. A suction gauge is usually attached to the automatic pump. A reading of 7 on the gauge, which is equivalent to 7 inches (17.7 cm.) of mercury, is the optimum of suction. The hole by which the pressure is interrupted should be fairly large to ensure prompt and complete fluctuations. Immediately continuous with the tip there should be a glass reservoir for overflow. The ordinary Sorensen goose-necked glass tube and suction tip is used by most operators. The automatic pump has the advantage over hand-pumps and rubber bulbs, of assuring a vacuum at the moment the patient manages to get his pharynx in the 'K' position. When the patient swallows or says K, K, the nasopharynx is closed off from the oropharynx, the nose thereby becoming a closed cavity. The solutions for the washouts must be carefully chosen. The simplest of these and the one usually employed is an isotonic or physiological salt solution. If antiseptics are used at all they must be carefully chosen for their non-irritating and non-toxic qualities. Dilute solutions of the common silver colloids are generally employed. Argyrol is used in concentrations of 1-10%. As a general rule, a mucous membrane which responds at all to palliative treatment recovers with the establishment of ventilation and drainage without the use of antiseptics.

The sulphonamides have given very indifferent results. When they were first tried in chronic maxillary sinusitis, the sudden cessation of purulent secretion seemed miraculous, until it was discovered that instead of being suppressed, these secretions were merely coagulated in a single large lump too bulky to make its way out of an ostium. Whalen tried the local use of sulphadiazine in the concentration of 2.5% in aerosol, and found it to be without effect in controlling the progress of nasal sinus disease, either of the acute or chronic type. He had some success by giving full doses of sulphonamides by mouth. Woodward found solutions of penicillin in concentrations of 250-500 units per c.c. to have no damaging effect on the cilia or the epithelium of the respiratory mucosa in clinical practice. Solutions of higher concentration tend to impede ciliary action in various degrees. He reported on a large series of carefully controlled observations and came to the conclusion that the effects of penicillin in the nose were very slight,

and the results of local therapy on the whole, very disappointing. Cocaine must be used sparingly, if at all, in displacement therapy, owing sometimes to undesirable cocaine reactions and toxic symptoms supervening in susceptible cases.

DISPLACEMENT IN CHILDREN

This type of treatment is very valuable in the persistently discharging noses of children which fail to respond to the usual drops and lotions. Sinusitis in children is generally seen between the fourth and tenth years. The ethmoid is well-developed at birth, the maxillary sinus is fully developed only at puberty, and the sphenoid and frontal sinuses, about the twelfth year. A discharge in the middle meatus in a child under six usually means involvement of the ethmoid or maxillary sinuses. Tenderness over the thin areas of the sinus walls is of great assistance in the diagnosis in older children. The recognition of a sinus infection in children is frequently overlooked.

Local treatment consisting of a small amount of suction carefully applied for a short interval of half to one minute is very effective. Long periods of negative pressure should not be applied as a secondary oedema may follow. Children usually co-operate very well and one has surprisingly little trouble with them if a little patience is exercised. The ethmoids and maxillary antra are of special clinical significance in small children; the frontal and sphenoid sinuses are not. Children who are too young to co-operate should be swathed in a sheet and laid in the usual position. With the head thus extended the pharynx closes naturally, especially if the child cries, and there is no real trouble in procuring a vacuum when the tip is applied.

Proetz recommends from 2 to 8 c.c. of 1% ephedrine by displacement every few days. The discharge quickly diminishes and soon ceases altogether. This is the rule

if the condition is amenable to treatment by this method. Cases which fail to respond in any degree in this short time are unlikely to respond at all. Here, too, the establishment of ventilation and drainage with the least possible trauma is of the greatest importance.

Allergic Changes in the Sinuses. It is very difficult to fill the sinuses by displacement while the patient is under the influence of an allergic attack, owing to the extent and rapidity with which the sinus mucosa swells. The living membrane of the maxillary sinus can, under the influence of an allergic reaction, increase in thickness from a fraction of 1 mm. to 1 cm. or more overnight.

CONCLUSIONS

My own observations on 50 consecutive cases treated by displacement with ephedrine 1% and normal isotonic physiological saline solution, gave very gratifying results. These cases were sub-acute as well as chronic ones. From four to eight instillations at 3 to 7 days' interval, were given in each case. Treatment was stopped as soon as the washings were clear and the symptoms disappeared. Almost all cases were greatly relieved of their post nasal discharge, nasal obstruction, and headaches. In some of these cases additional treatment such as removal of polypi, submucous resection of bad septal deviations, and window resections of antra was instituted. One observed that even when the first displacement produced frank pus with a foul odour, the infection sometimes cleared up with irrigations alone. The best results were obtained in the sub-acute catarrhal type of sinusitis.

I do not think by any means that this displacement treatment is a 'cure all' for every case of sinusitis, but it is well worth while giving it at least a trial. The latest trend of sinus treatment is a strong leaning to the conservative side.

THE PREMATURE INFANT

A NEW APPROACH IN ITS MANAGEMENT*

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This paper is a personal study conducted on 20 premature infants admitted to the Premature Unit of St. Mary's Maternity Hospital under Professor Wilfred Gaisford of the Department of Child Health, University of Manchester, during the early months of 1948. The birth weights of the infants varied from 2 lb. 11 oz. to 5 lb. 5 oz. the majority being in the 3-4 lb. group.

The essential feature in the new approach to the management of the premature infant is the initial starvation programme of 72 hours which is a routine procedure in the Premature Unit at Manchester.

*This paper was read at the Medical Congress of the Association held at Cape Town in September 1949.

The study aimed at assessing the advantages to be gained thereby and any deleterious effects produced. The main principles involved in the management of the premature infant comprise:

1. The establishment and maintenance of respiration.
2. The maintenance of body heat.
3. Proper technique of feeding.
4. Protection from infection.
5. The immediate treatment of complications.
6. Supervision by a nursing staff specially trained in the care of premature infants.

A proper technique of feeding constitutes the most important single factor in maintaining life in the premature infant.

The starvation programme of 72 hours or more instituted at this unit has as its basis the following well-known facts:

1. Premature infants born in the seventh or eighth month rarely show a disposition to feed spontaneously during the first days of life.

2. In the distribution of premature neonatal deaths 66% occur in the first 48 hours of which 70% are due to prematurity *per se* (the remaining causes being intracranial trauma, atelectasis, infection and congenital anomalies). In the majority of cases the infant dies immediately after being fed. Ingraham quotes 12% only of all deaths having an anatomical basis, 88% being due to simple prematurity. Ignorance of correct methods of feeding constitutes a major factor in this mortality.

3. The starvation programme prevents abdominal distension with resulting dyspnoea and cyanosis and lessens the tendency to gastric upset—both factors of paramount importance in the early days of life of the premature infant.

4. A high proportion of all premature infants regurgitate some food during their first three days of life, owing to the vertical lie of the stomach in the seventh and eighth months of foetal life, the poorly developed cardiac sphincter and the strong pyloric sphincter.

5. The undeveloped swallowing and cough reflexes consequent upon an incomplete development of the central nervous system favours the aspiration of milk or vomitus into the respiratory passages.

No food or fluids even water are given until the infant manifests signs of hunger or thirst. This may be 72 hours or more. Apart from changing the infant, keeping it warm and administering oxygen when necessary the infant is left severely alone. The period of starvation in the infants studied varied from 36 to 72 hours.

Expressed breast milk (undiluted) or a modified half cream lactic acid dried milk product called 'Lacidac' was fed to all the infants, two feeds of 5% glucose water in half strength normal saline preceding the milk feeds. This modified dried milk has a reconstituted caloric value of 20 per oz. and contains:

1 oz. Reconstituted Food (4 measures to 3 oz. water).

Fat, 2.2%.

Protein, 4.05%.

Lactose and other sugars, 8.78%.

Minerals, 0.9%.

Lactic acid, 0.3% (1 drachm to the quart).

The smallest infants who could neither suck nor swallow were fed by gavage, a soft rubber catheter being introduced through the mouth to within 1 inch above the cardiac sphincter, this level being obtained by measuring from the bridge of the nose to the tip of the ensiform cartilage. This was routine in infants under 3 lb. Great care is necessary in oesophageal feeding both at the commencement and at the time of withdrawal of the catheter.

After the feed the infant is placed on the right side to allow of more rapid emptying of the stomach, thus minimising cardiac embarrassment by the pressure of a dilated stomach. Belcroy feeding was instituted for

those infants able to swallow but with poor powers of sucking while the larger infants in the 4-5 lb. group were given the bottle until able to suck at the breast. Infants weighing under 4½ lb. were fed two-hourly (11 feeds in 24 hours) initially as illustrated on the charts, reduced to eight feeds in the 24 hours and finally to seven feeds (3-hourly). The infants were weighed at birth, then on the fourth, seventh and tenth days and every third day thereafter. Breast milk or the standard formula was given irrespective of the state of immaturity of the infant, the only variables being the number and volume of feeds. No attempt was made to secure the ingestion of any definite caloric intake or any particular degree of weight, the individual gain, the infant's general well-being and his capacity being the determining factors in deciding how much he should be offered and how often.

The fluid requirement in many premature units is assessed as 1 oz./lb./day on the fourth day, 2 oz./lb./day on the seventh day, 2½ oz./lb./day on the tenth day and 3 oz./lb./day on the fourteenth day. The charts attached reveal a close similarity in the total daily intake in this unit.

Synkavit (vitamin K preparation) 2½ mgm. is given routinely to all premature infants orally on the first day, and to the very small infants 2½-5 mgm. parenterally.

Vitamin C as ascorbic acid 50 mgm./day is administered from the fourth day increasing to 100 mgm. on the tenth day with a maintenance dose of 50 mgm./day on discharge from the unit. The dual function of vitamin C in the formation of mesodermal intercellular substance and its value in protein metabolism indicates the great need of this vitamin in adequate amount and in the early days of life. Vitamins A and D as adexolin were given from the tenth day commencing with 1 minim (approximately 160 units of vitamin D and 700 units of vitamin A) per day and increasing by 1 minim every 3-4 days until the required 10 minims/day (1,600 units vitamin D) were reached. Studies indicate the relation of vitamin A specially in enhancing the resistance of the infant to respiratory infection, a fact of signal importance in the premature infant. Vitamin D is given early and in large amounts to counteract the adverse effects which a deficiency of the vitamin might produce in a rapidly growing organism.

Iron. The maximum storage of iron in the foetus occurs in the last trimester of pregnancy—hence the importance of administering iron to premature infants from the fourth week. Furthermore the relatively more rapid gain in weight (premature infants double their birth weight in three months and treble it in five-six months) demands an adequate reserve of iron. The preparation used in this unit is ferrous sulphate commencing with ½ gr./day in liquid form increasing to 1½ gr./day within a month or two. Little if any digestive upset results. Premature infants are very prone to iron deficiency anaemia hence its early administration serves as a source from which the body can draw.

Thyroid. Lethargic infants at the stage of bottle or breast feeding are given 1/20 gr./lb./day.

Oxygen. Oxygen at the rate of 3-4 litres/minute through a warm water bottle connected to a tube and rubber

Infant	Weight lb. oz.	Age in Days	Reaction	Albumin	Urine		
					Red Cells	Acetone	Sugar
Baby S. Feeding commenced at 54 hours	3 15	1	Acid	Trace	Nil	Nil	Nil
		2	Acid	Trace	Occas.	Nil	
		3	Acid	Trace	Nil	Nil	
Baby F. Feeding commenced at 64 hours	3 14	1	Acid	Trace	Nil	Nil	Nil
		2	Acid	Trace	Nil	Nil	Nil
		3	Acid	Trace	Nil	Nil	Nil
Baby E. Feeding commenced at 72 hours	4 6	1	Neutral	Trace	Nil	Nil	Nil
		2	Acid	Trace	Nil	Nil	Nil
		3	Acid	Trace	Nil	Nil	Nil
Baby C. Feeding commenced at 72 hours	2 6	1	Alkaline	Trace	Nil	Faint + ve.	Nil
		2	Alkaline	Trace	Nil	Faint + ve.	Nil
		3	Alkaline	Trace	Nil	Faint + ve.	Nil
Baby A. Feeding commenced at 60 hours	4 14	1	Acid	Trace	Nil	Nil	Nil
		2	Acid	Trace	Nil	Nil	Insuff.
		3	Acid	Trace	Nil	Nil	Nil
Baby H. Fed in customary manner ..	5 10	1	Acid	Trace	Nil	Nil	Nil
		2	Acid	Trace	Nil	Nil	Nil
		3	Acid	Trace	Nil	Nil	Nil
Baby M. Fed in customary manner ..	6 0	1	Acid	Trace	Occas.	Nil	Nil
		2	Acid	Trace	Nil	Nil	Nil
		3	Acid	Trace	Nil	Nil	Nil
Baby W. Fed in customary manner ..	5 9	1	Acid	Trace	Nil	Trace	Nil
		2	Acid	Trace	Nil	Nil	Nil
		3	Acid	Trace	Nil	Nil	Nil
Baby M. Fed in customary manner ..	6 0	1	Acid	Trace	Occas.	Nil	Nil
		2	Acid	Trace	Nil	Nil	Nil
		3	Acid	Trace	Nil	Nil	Nil
Baby C. Fed in customary manner ..	5 12	1	Acid	Trace	Nil	Nil	Nil
		2	Acid	Trace	Occas.	Nil	Nil
		3	Acid	Trace	Nil	Nil	Nil

At Three Months

Infant	Birth Weight lb. oz.	Weight lb. oz.	Hb.	Red cells (per c.mm.)	General Condition
P ..	4 0	7 6	94%	5.1 million	Very good.
L ..	3 8	10 1	68%	3.9 million	Very good.
H ..	3 9	8 4	76%	4.8 million	Very good but has an inguinal hernia.
W. ..	4 6	12 4	60%	3.6 million	Very good.
B. ..	3 14	9 14	66%	4.47 million	Very good.
W. ..	4 5	9 4	60%	4.0 million	Very good.
N. (twin)	2 11	6 11	72%	3.8 million	Very good.
N. (twin)	3 15	8 7	68%	3.4 million	Very good.
C. ..	4 12	9 0	70%	4.7 million	Very good.
R. ..	4 15	9 15	58%	3.3 million	Pale infant. Mother did not give iron mixture prescribed.

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Infant	Weight	Age in Days	Blood sugar in mg. per 100 c.c. (McLean's Method)
Baby S.	3-lb. 15-oz.	1	28
Feeding commenced at 54 hours		2	30
		3	65
Baby R.	4-lb. 5-oz.	1	40
Feeding commenced at 54 hours		2	80
		3	80
Baby C.	4-lb. 0-oz.	1	40
Feeding commenced at 56 hours		2	
		3	
Baby R.	4-lb. 12-oz.	1	30
Feeding commenced at 54 hours		2	80
		3	80
Baby F.	3-lb. 14-oz.	1	65
Feeding commenced at 64 hours		2	40
		3	30
Baby E.	4-lb. 3-oz.	1	53
Feeding commenced at 58 hours		2	40
		3	40
Baby E.	4-lb. 6-oz.	1	80
Feeding commenced at 72 hours		2	65
		3	60

A number of the infants studied were followed up at the third month of life to assess their weights and general condition. In addition haemoglobin estimations and red blood cell counts were made.

An investigation was conducted into the blood sugar of these premature infants during the starvation period.

Van Creveld, in an extensive study of the carbohydrate metabolism of premature infants found a fasting blood sugar varying between 27 and 81 mg. per 100 c.c. in 60 cases. No phenomena associated with hypoglycaemia were found possibly due to the diminished sensitivity of an undeveloped central nervous system to changes in the blood sugar. This hypoglycaemia is due to the functional immaturity of the liver. Our cases similarly manifested no clinical evidence of hypoglycaemia.

The graphs illustrate the starvation regime, gain in weight-feeding formulae and general state of the infants.

PASSING EVENTS

Dr. Robert M. Kark, formerly of Cape Town, has been appointed Professor of Medicine at the University of Illinois.

Professor Kark is also the Medical Liaison Officer for North America of the South African Council for Scientific and Industrial Research.

EAST LONDON MEDICAL WIVES' SOCIAL COMMITTEE

The East London Medical Wives' Social Committee has been established (as a result of the enthusiastic and energetic efforts of the wives of our colleagues) with the object of raising funds for various societies through their activities as a small social body.

This Committee will also offer hospitality to practitioners and their wives visiting East London. The Committee will arrange golf, tennis, bowls, bridge, etc., for those interested.

Visitors to East London who wish to make use of these facilities should telephone the Honorary Secretary, Mrs. Rae Segall (East London 2271). The Chairlady of the Committee is Mrs. Norah Smythe.

VERENIGINGSNUUS : ASSOCIATION NEWS

POST-GRADUATE MEDICAL AND DENTAL EDUCATION, EXAMINATION AND REGISTRATION IN THE UNION *

As a result of a report to it by Professor Ryrrie that the University of Cape Town was of opinion that the higher degrees of the University should remain academic qualifications and not become merely qualifications for specialist registration, the Medical and Dental Council resolved to call a conference of interested bodies to discuss Post-Graduate Medical and Dental Education, Examination and Registration in the Union. The conference was held in Cape Town on 13 December 1949.

Representation: The South African Medical and Dental Council; the Faculty of Medicine, University of Cape Town; the Faculty of Medicine, University of Pretoria; the Faculty of Medicine, University of Witwatersrand; the Faculty of Dentistry, University of Witwatersrand; the Medical Association of South Africa; the Dental Association of South Africa; the Union Department of Health.

As a basis of discussion copies of the address by Professor Davie and copies of Chapter 20 of the Goodenough Report were circularized.

Dr. K. Bremer was nominated to the Chair. The Chairman opened the meeting by stating how the conference had come to be called. He drew attention to two resolutions of the Executive of Medical Council, viz.:

1. That Medical Council would not itself be concerned either directly or by representation in an examining body. Its relationship to such a body, if established, would be its normal relationship to medical education and training and to registrable qualifications.
2. That it considered some form of correlation of examination standards advisable.

ESTABLISHMENT OF COLLEGE

(a) It was agreed that in South Africa increased facilities for Post-Graduate Education were needed.

(b) It was moved and seconded that 'it is advisable and expedient to establish a College of Surgeons and Physicians of South Africa'.

(c) It was moved that the proposed College should grant only post-graduate diplomas. After discussion this motion was withdrawn.

It was suggested by Mr. Raikes that a co-ordinating Council of the various Medical Schools, to supervise post-graduate training and diplomas, would be preferable to a college.

The Chairman directed that further consideration on the question of the establishment of a College be discussed in the light of a series of questions that had been compiled by Mr. Goldschmidt. The questions were as follows:—

1. Should a body or bodies, akin to the Colleges in Britain, be established in South Africa?
2. Should one College to examine for all specialities be created, or should separate Colleges representing medicine, surgery, obstetrics and gynaecology, etc., be established?
3. Should such a College be a body independent of:
 - i. The South African Medical and Dental Council;
 - ii. The Universities;
 - iii. The Medical Association of South Africa?
4. How should a College be established—
 - i. By charter, or
 - ii. By the creation of a company?
5. Should the College grant diplomas
 - i. Of a standard to register as a medical practitioner;
 - ii. A higher status;
 - iii. Or both?
6. Should the College 'teach' otherwise than by provision of lectures, etc.?
7. How should the College be financed?

* This report is to be discussed by members at Branch meetings, and they are therefore asked to consider its contents.

CONCLUSIONS

It was agreed that:

1. Delegates report the proceedings of the conference to the various bodies which they represented.

2. Each body present for consideration at a subsequent conference a memorandum on the matters which were discussed at the present conference, the constitution and functions of a body such as was envisaged, any alternative scheme which may meet the situation, the facilities for post-graduate education and instruction and the manner in which it will be effected in the event of the establishment of a College such as was envisaged, and any other matters which may be relevant.

3. The above memorandum be submitted to the South African Medical and Dental Council, which will then convene a further conference in approximately six months' time.

4. The various bodies represented advise the subsequent conference of their opinion regarding the desirability, or otherwise, of the establishment of a body such as was envisaged.

REVIEWS OF BOOKS

PARATHYROIDS AND BONE DISEASE

The Parathyroid Glands and Metabolic Bone Disease. By F. Albright, A.B., M.D. and E. C. Reifenstein, Jr., A.B., M.D., F.A.C.P. (Pp. 393 + xxvi. With 157 illustrations. 44s.) London: Baillière, Tindall & Cox. 1948.

Contents: 1. The Parathyroid Glands: Normal and Pathologic Physiology. 2. Clinical Hypoparathyroidism. 3. Clinical Hyperparathyroidism. 4. Mode of Action of Vitamin D and Dihydroxycholesterol (A.T. 10). 5. Metabolic Bone Disease: General Considerations. 6. Metabolic Bone Disease: Osteoporosis. 7. Metabolic Bone Disease: Osteomalacia. 8. Polyostotic Fibrous Dysplasia (Osteitis Fibrosa Disseminata). 9. Paget's Disease (Osteitis Deformans). Appendix.

This monograph carries on the account of the researches into mineral metabolism initiated by Dr. Joseph C. Aub and his associates.

Much of the work has appeared from time to time in papers published by the very considerable team of workers interested in this field of investigation at the Massachusetts General Hospital.

The present monograph is a review of the position up to the time of writing, and the energetic, irrepressible, enthusiastic and unconventional approach of Professor Albright impresses very considerable portions of the book.

The account of the normal physiology of the parathyroid glands is masterly, and the clinical variations, due to under- or over-function of these glands, are very comprehensively set out.

The volume is of importance not only to students of physiology, but is also a *sine qua non* for the physician and the pathologist.

Typical of the implications of the survey is the condition of osteoporosis in relation to Selye's 'Adaptation Syndrome' (the 'Alarm Reaction'). Albright introduced a stimulating hypothesis involving the adrenal cortex, in considering the alarm reaction, as long ago as 1942 when he pointed out that the adrenal cortex secreted the N (nitrogen) hormone stimulating anabolism, and the S (sugar) hormone inhibiting protoplasmic anabolism.

It is interesting that in Cushing's syndrome as well as in the alarm reaction there is a high S hormone production, probably leading, amongst other things, to a decreased production of protoplasm in general. This, in terms of bone metabolism, means osteoporosis.

Controlled studies, however, show that the relation of the alarm reaction to calcium metabolism is not as simple as it would appear, even on the basis of Selye's hypothesis. Control observations on the effect of immobilization and

decreased food intake, which can themselves account for calcium excretion after fractures, must be considered as well.

The authors have lost sight of none of these important points in dealing with the numerous and complicated problems which are characteristic of the physiology and pathology of mineral metabolism, nor do they hesitate to change their hypotheses as new data come to light.

They have disarmed criticism of the liberties they have taken with the English language by an *apologia* in the preface. Nevertheless, their medical colloquialism has certainly made an extremely good and interesting book very lively as well.

THE PREMATURE INFANT

The Premature Infant: Medical and Nursing Care. By Julius H. Hess, M.D. and Evelyn C. Lundeen, R.N. (Pp. 381 + xix. With 101 illustrations. 42s.) London: J. B. Lippincott Company. Second Edition. 1949.

Contents: 1. What Constitutes Prematurity in the Infant. 2. Physiologic Development. 3. Growth and Development. 4. Minimum Requirements for Nurseries for Full-Term Infants and Premature Infant Stations. 5. Incubators. 6. The Nurse and her Technic. 7. Routine of the Premature Infant Station and Routine Procedures. 8. Immediate Care After Birth. 9. Transportation. 10. Home Care. 11. Feeding and Feeding Techniques. 12. Breast Milk. 13. Artificial Feeding. 14. Vitamins and Endocrines. 15. Medical Therapeutic Agents. 16. General Therapeutic Measures. 17. Oxygen Therapy. 18. Asphyxia, Anoxia and Cyanosis. 19. Hemorrhage in the Newborn Premature. 20. Erythroblastosis Fetalis. 21. The Liver and Bile Passages. 22. The Skin. 23. The Eyes. 24. The Ears. 25. Diseases of the Respiratory Tract. 26. Disorders of the Gastro-Intestinal Tract. 27. Hernia. 28. Anemia in the Premature Infant. 29. Rickets, Tetany and Scurvy. 30. Meningitis. 31. Syphilis. 32. Later Physical and Mental Development. 33. Suggested Teaching Outline for Classes on Nursing of Premature Infants. 34. City-wide and State-wide Plans for Care of the Premature Infant.

In paediatric teaching and practice ever increasing attention is being directed to the reduction of infant mortality and morbidity during the first few weeks of life. The problems and dangers of the neonatal period are of even greater importance and urgency in the case of the premature infant. Since the publication of his first major work on prematurity, more than 25 years ago, Dr. Julius Hess has come to be recognized as a world authority on this subject. The first edition of this textbook (written in collaboration with Sister Lundeen) appeared in 1941 and is fully accepted as one of the most comprehensive and authoritative works on the premature baby available to-day. The book is largely based on the experience over many years at the Premature Infant Station of the Sarah Morris Hospital, Chicago. The second edition contributes new material on diseases of the eye and skin, on the anaemias, congenital syphilis, meningitides and on recent advances with reference to feeding methods. Additional information is given on therapeutic applications of sulphonamides and the antibiotics and on the treatment of infectious diarrhoea and blood dyscrasias of the newborn. An outstanding chapter discusses the Rh factor. In recent years ever more attention has been drawn, in the American paediatric literature, to the condition of retrolental fibroplasia as a complication of prematurity and a full account of this condition has been added.

The energy and organization with which the problem of prematurity is being tackled in the larger American centres and as described in this book is most admirable. Thinking of South African conditions one can only envy the apparently limitless funds available in the United States for the building, staffing and equipping of elaborate prematurity units. Although many of the methods dealt with in this volume are dependent on equipment and nursing facilities not generally available here, most of the practical procedures presented in such clear detail, are universally applicable and a comprehensive chapter deals with the home care of a premature baby.

One notes with interest and a certain awe the demands of modern preventive medicine as reflected in the routine 'Schedule of Immunization' for all infants attending the Sarah Morris Hospital. This involves nine inoculations in the first 36 months, starting with pertussis vaccine at three months of age and not counting smallpox vaccination at six months and two separate Schick tests.

One notes, too, the recommended use of small intramuscular injections of Rh negative whole blood, as a routine measure in cerebral haemorrhage, inanition and various infections.

No mention is made of the practice advocated by many British authorities of administering thyroid extract as a general metabolic stimulant in special cases.

The use of silver nitrate eye drops at birth as a prophylactic against ophthalmia has fallen out of favour both in Britain and America. At the Sarah Morris Hospital it has been replaced for this purpose by penicillin drops.

In conclusion, one has no hesitation in recommending the possession of this book as almost essential to all those responsible for the care of premature babies.

STARLING'S PHYSIOLOGY

Principles of Human Physiology. B. C. Lovatt Evans, D.Sc., F.R.C.P., F.R.S., LL.D. (Pp. 1193 + xii. With 693 illustrations, some in colour. 42s.) London: J. & A. Churchill Ltd. 1948.

Contents: 1. Book I: General Principles. 2. Book II: Tissues Subserving Movement and Conduction—Muscle and Nerve. 3. Book III: Centralized Control and Co-ordination—The Central Nervous System. 4. Book IV: The Supplying of Information—The Special Senses. 5. Book V: Systems for Distribution of Materials—Blood, Circulation and Respiration. 6. Book VI: The Intake of Materials—Nutrition, Metabolism. 7. Book VII: The Removal of Waste Material and Temperature Conservation—Excretion and Temperature Regulation. 8. Book VIII: The Provision of Special Chemical Stimulants, and of Measures for Continuance of the Species—The Endocrine Organs and Reproduction.

Students of physiology as well as practitioners of medicine will welcome the present edition of this standard work, which last saw a new edition in 1945. The time for revision is therefore very appropriate, especially in view of the very considerable advances which have taken place in physiology during and since the war.

Because of the relatively considerable space given to the ABO blood groups, it seems desirable that more space should be devoted to the Rh factor than 1½ in. in small type, since its genetic importance and interest from the standpoint of comparative serology and ethnology certainly merit a more extensive note.

The section on the central nervous system maintains its position as a pre-eminent contribution in the field of exposition and explanation and few textbooks of physiology deal so adequately with the physiology of the special senses.

The section on endocrine organs is concise and comprehensive enough for the needs of the students and practitioners who may look to it for basic guidance.

Dr. Lovatt Evans' revision of this volume remains an important and necessary book for all those concerned with how the human body functions.

THE VITAMINS

Vitaminology: The Chemistry and Function of the Vitamins. By Walter H. Eddy, Ph.D. (Pp. 365 + v, with 60 tables. 46s. 6d.) London: Baillière, Tindall and Cox. 1949.

Contents: 1. Introduction: What is a Vitamin? 2. Vitamin A. 3. Vitamin D. 4. Vitamin E. 5. Vitamin K. 6. The Water-Soluble Vitamins. 7. Vitamin B₁ (Thiamine). 8. Vitamin B (Riboflavin). 9. Vitamin P-P (Niacin). 10. Vitamin B₆ (Pyridoxine). 11. Pantothenic Acid. 12. Inositol. 13. Paba. 14. Biotin. 15. Choline. 16. Folic Acids. 17. Vitamin C (Ascorbic Acid). 18. Vitamins P. 19. Some Postulated Vitamins. Index.

This volume is a very suitable companion to the well-known monograph on *The Avitaminoses* written by the author in collaboration with Dr. Dalldorf. The volume under review confines itself more closely to the chemistry and the physiology of the vitamins, but it forms, nevertheless, a very necessary survey for the physician who wishes to acquire a totally scientific basis for his knowledge of the vitamins.

A useful feature of each chapter is the inclusion of a section dealing with the application of our knowledge of the vitamins to human requirements and diseases. The clinical assessment

of the therapeutic value of vitamin preparations is often a matter of great difficulty, but the author has maintained a very sound sense of proportion, especially about the more recent and more novel claims. The optimism, e.g. expressed by several investigators about the alleviation of the nausea of pregnancy by means of pyridoxine (p. 191) is cautiously counterbalanced by the reports of other investigators who, like the reviewer, have found the treatment of this condition with pyridoxine an expensive disappointment.

The monograph is extremely well documented and undoubtedly represents a most up-to-date survey of the vitamins within so modest a compass. The book is essential for physiologists and all students of the problems of nutrition. It will also be extremely useful to those interested in the more biochemical aspects of the subject.

HISTOLOGY

Textbook of Histology for Medical Students. By Evelyn E. Hewer, D.Sc. (Lond.). (Pp. 432 + xiii, with 418 illustrations. 5th ed. 25s.) London: William Heinemann Medical Books Ltd. 1949.

Contents: 1. The Cell. 2. Tissues. Epithelial Tissue. 3. Connective Tissues. Blood. Lymph. 4. Development of Blood Corpuscles and their Destruction. Marrow. 5. Connective Tissues: Connective Tissue Proper. 6. Connective Tissues: Cartilage. 7. Connective Tissues: Bone. 8. Muscular Tissue. 9. Nervous Tissues. Nerve Cells. 10. Nerve Fibres. Nerve Endings. 11. Nerves and Nerve Ganglia. 12. Neuroglia. 13. General Structure of Organs. 14. Blood Circulatory System. Arteries, Veins. 15. Capillaries. 16. Heart. 17. Lymphatic System. 18. Thymus. Spleen. 19. Suprarenal Glands. 20. Thyroid. Parathyroid. 21. Pineal. Pituitary. 22. Skin. 23. Respiratory System. 24. Digestive System. Mouth. 25. Digestive System: Oesophagus. Stomach. 26. Digestive System: Small Intestine. Large Intestine. 27. Digestive System: Liver. Gall Bladder. Pancreas. 28. Kidney. Ureter. Bladder. Urethra. 29. Male Reproductive Organs. Testis. 30. Male Reproductive Organs: Ducts and Glands. 31. Female Reproductive Organs. Ovary. 32. Female Reproductive Organs: Ducts and Placenta. 33. Mammary Gland. 34. The Eye. 35. The Ear. 36. Central Nervous System. 37. Certain Abnormal Variations in Minute Structure. 38. Protective Mechanisms of the Body. Appendix. Histological Methods. Index.

Dr. Evelyn E. Hewer is to be congratulated on the new edition of her by now well-known textbook of histology. The need to bring out a new edition only two years after the previous one and only one year after the reprinting of the fourth edition bears testimony to the great practical usefulness which this book has found amongst medical students. The half-tone illustrations can truly be described as magnificent and the only constructive criticism one would care to make about so excellent a volume is that the author should replace most of the line drawings with diagrams of greater finish. This applies particularly to those in the first seven or eight chapters. These line drawings are not in the same class as the half-tone illustrations and their replacement by a more polished set of diagrams would bring this textbook very near perfection.

A pleasing feature of this volume is the use of human material to illustrate most of the points, and the author has wisely indicated certain variations which help to impress on the student mind the fact that the normal appearance lies within a definite range of gradations and varies between two extremes.

In view of the medico-legal significance which has been attached to studies of the human foetal lung, the inclusion of four photographs illustrating the human foetal lung appearance, from the six-weeks' embryo to the full-term foetus, is strongly to be commended. Recent work, however, does not bear out the statement made on p. 225 that 'the foetal alveoli are lined by cubical epithelium which becomes flattened out when the lungs are distended with air'. It seems more than likely that the alveolar lining reaches, at full term, a pattern which permits respiration because the cells are already considerably flattened.

A useful appendix on the practical aspects of histological methods completes an extremely commendable textbook which all medical students will find of the greatest assistance at a price well within their means.

RENAL ORIGIN OF HYPERTENSION

Renal Origin of Hypertension. By Harry Goldblatt, M.D., C.M. (Pp. 126 + viii with illustrations. 15s.) London: Blackwell Scientific Publications Ltd. 1948.

Contents: 1. Introduction. 2. Production of Experimental Renal Hypertension by Various Methods. 3. Production of Experimental Renal Hypertension by Constriction of Main Renal Artery. 4. Effect on Blood Pressure of Moderate Constriction of the Main Artery of Only One Kidney. 5. Effect on Blood Pressure of Moderate Constriction of Both Main Renal Arteries: The Benign Phase of Experimental Renal Hypertension. 6. Effect on Blood Pressure of Great Constriction of Both Main Renal Arteries: The Malignant Phase of Experimental Renal Hypertension. 7. Pathologic Changes in the Organs of Animals with Persistent Hypertension. 8. Pathogenesis (Mechanism of Development) of Experimental Renal Hypertension. 9. The Humoral Mechanism of Experimental Renal Hypertension. 10. Renin. 11. Hypertensinogen. 12. Hypertensin. 13. Hypertensinase. 14. Mechanism and Site of Formation and Release of Renin. 15. The Juxtaglomerular Apparatus. 16. The Treatment of Hypertension. 17. Summary of the Similarities and Differences Between Human Essential and Experimental Human Hypertension.

This little book is one of the excellent monographs in the *American Lectures in Pathology* series. These lectures cover a wide range of subjects by acknowledged authorities in various fields.

Dr. Harry Goldblatt, in this lecture, gives a very readable and concise account of the very extensive work which has been done on hypertension of renal origin. In the introduction he briefly surveys the observations and work which led to his own fundamental experiments in 1928, when he demonstrated the production of persistent hypertension in the dog by partial occlusion of one renal artery. Subsequent chapters outline the developments in this field, leading to the discovery of renin, hypertensinogen, hypertensin and hypertensinase, and the properties of these substances are described. There is also a chapter on the treatment of experimental hypertension by means of antirenin and other less well defined vaso-excitor and vaso-depressor substances. The significance of these in the humoral mechanism of renal hypertension is, as yet, not clear.

Dr. Goldblatt is a firm believer in the renal origin of essential hypertension in man and he develops this theory throughout the book. Naturally, in the small compass of the lecture it is impossible for him to deal at length with points for and against the renal origin of essential hypertension, but as far as is possible he states the problem fairly and without bias. However, some of the difficulties possibly are understated and the findings of Castleman and Smithwick on renal biopsy in hypertension particularly are dismissed with rather insufficient consideration.

The book is beautifully produced and can be strongly recommended to practically every medical practitioner and student other than the specialist in this field. A very great deal of information is skilfully condensed and presented, so that it can be readily assimilated in one evening's study.

INDUSTRIAL MEDICINE

The Proceedings of the Ninth International Congress on Industrial Medicine, London, 13-17 September 1948. (Pp. 1090 + xxv, with illustrations, 60s.) Bristol: John Wright and Sons, Limited. 1949.

Contents: 1. Industrial Medicine—Social Aspects. 2. Industrial Medicine—The Environment. 3. Industrial Medicine—Nursing. 4. Industrial Medicine—Clinical. 5. Industrial Medicine—Practice. 6. Industrial Medicine—Special.

Industrial medicine has made very rapid strides in recent years and occupies to-day a position of considerable eminence amongst the medical specialties. This encyclopaedic record of the Proceedings of the Ninth International Congress should be in the hands of all students interested in social as well as industrial medicine and nursing.

The vast scope covered by the Conference has resulted in a publication which contains something of interest to every branch of medical practice.

Considerable portions of the discussions of each paper are reported fairly fully, and this undoubtedly adds to the interest as well as the value of this extraordinarily comprehensive discussion of the modern problems of industrial medicine.

MODERN PRACTICE IN OPHTHALMOLOGY

Modern Practice in Ophthalmology. Edited by H. B. Stallard, M.B.E., M.A., M.D., F.R.C.S. (Pp. 524 + xx, with 231 illustrations. 69s. 6d.) Butterworth and Company (Africa), Limited, 1, Lincoln's Court, Masonic Grove, Durban. 1949.

Contents: 1. Anatomy and Physiology. 2. Pathology. 3. Medical Ophthalmology. 4. Methods of Examination. 5. Ocular Therapeutics. 6. Diseases of the Eyelids. 7. Diseases of the Lacrimal Apparatus. 8. Diseases of the Conjunctiva. 9. Diseases of the Cornea and Sclera. 10. Diseases of the Uveal Tract. 11. Diseases of the Retina. 12. Diseases of the Optic Nerve. 13. Diseases of the Vitreous Body. 14. Diseases of the Lens. 15. Glaucoma. 16. Refractive Errors. 17. Strabismus and Heterophoria. 18. Injuries of the Eye. 19. Diseases of the Orbit. 20. Tropical Ophthalmology. 21. Surgical Operations on the Eye, Eyelids and Orbit.

This book differs somewhat from the usual type of textbook on ophthalmology, in that a team of authors, well-known ophthalmologists, possessing special knowledge in their subjects, has written it under the editorship of Mr. H. B. Stallard, M.D., F.R.C.S. He states in the preface that the purpose of the book is to give the *general practitioner* an outline in the modern practice of ophthalmology. After reading through this book of nearly 500 pages, one would certainly also recommend it to the post-graduate student who intends to specialise in ophthalmology.

Chapter II deals with the pathology of the eye from practical and clinical aspects. It contains much useful information. Developmental abnormalities, infections, injuries, metabolic and endocrine disturbances, tumours and degenerations are considered in this order.

Medical ophthalmology, which includes neuro-ophthalmology, is discussed in Chapter III by Dr. Meadows, who has been physician to well-known ophthalmic hospitals for many years. It is written to the point and in a concise manner, but covers the whole field admirably.

One agrees with Mr. John Foster in his chapter on methods of examination where he states: 'Many medical patients are examined lying in bed in a bright room. This is quite an unsuitable position, and an effort should be made to get the patient up in a chair, if possible (and in a dark room), in order to examine the eye properly.' Perhaps one should add that use could be made of a small improvised portable dark room.

Dr. Somerville-Large, in discussing diseases of the conjunctiva, gives an excellent description of the modern treatment of ophthalmia neonatorum. This the general practitioner should find most instructive. Under the treatment of pterygium it is stated: 'The only other reason for (surgical) interference is a cosmetic one . . . a permanent corneal opacity always remains after removal, so that little improvement in appearance can be assured.' One cannot accept this unqualified statement. In this country, where the condition is a very common one and where operative treatment is so frequently carried out, many cases can be demonstrated where the growth has been so cleanly removed that no visible corneal scarring is evident, and definite improvement in appearance results.

Dr. John Nicholls deals with diseases of the retina in a lucid manner, and the classification he adopts is a very good one.

Mr. Williamson Noble has written an excellent chapter on refractive errors. It contains useful practical information. A section dealing with contact lenses is included.

The inclusion of a short chapter on *Tropical Ophthalmology*, a feature not usually found in textbooks, should prove useful to those practising in tropical countries.

Mr. H. B. Stallard, a surgeon of repute, illustrates his own chapter on common surgical operations on the eye and

its adnexa. His black and white drawings illustrating different operations are excellent and descriptive.

A short account of a new operation, conjunctivo-dacryocystotomy (Stallard's operation) is also given.

This book can certainly be recommended.

PATHOLOGY

Textbook of Pathology (General and Special). In Two Volumes. Edited by W. E. Carnegie Dickson, M.D., B.Sc., F.R.C.P. (Edin.). (Vol. 1. Pp. 790 + xv. Vol. 2. Pp. 790 + vii. With illustrations and 20 colour plates. £8 8s.) London: William Heinemann Ltd. New Fifth Edition, 1948.

Contents (Vol. I): 1. The Cells in Health and Disease. 2. Inflammation and Repair. 3. Infective Granulomata. 4. Viral Infections. 5. Bacterial and Viral Infections and Immunity. 6. Heat-Regulations and Fever. 7. Disturbances of the Circulation. 8. General Retrogressive Changes. 9. Necrosis and Gangrene. 10. Atrophy. 11. Hypertrophy and Hyperplasia. 12. Neoplasms. Tumours, or New-Growths. 13. Special Varieties of Tumours. 14. Animal Parasites. Section I.—Protozoa. Section II.—Metazoa. Invertebrata. 15. Diseases Due to Vitamin-Deficiency. 16. Diseases of the Circulatory System. Section I.—Developmental Abnormalities of the Pericardium, Heart, and Great Vessels. Section II.—Diseases and Injuries of the Pericardium and Heart. Section III.—Diseases of Blood-Vessels. 17. Diseases of the Respiratory System. Section I.—Diseases of the Nasal Cavities and Nasopharynx. Section II.—Diseases of the Larynx, Trachea and Bronchi. Section III.—Disease of the Lungs. Section IV.—Tuberculous Disease of the Lungs and Pleura. Section V.—Tumours of the Air-passages and Lungs. Section VI.—Diseases of the Pleura. 18. Disorders of the Blood and Diseases of the Blood-Forming Organs. Section I.—Introductory. Section II.—Variations in the Formed Constituents of the Blood. Section III.—The Blood-Forming Tissues. Section IV.—Special Pathology of the Blood and Blood-Forming Organs. 19. Diseases of the Lymphatic System. Section I.—Serous Membranes. Section II.—Lymphatic Vessels. Section III.—Lymphatic Nodes.

Contents (Vol. 2): 20. Diseases of the Spleen. 21. Disorders of the Reticulo-Endothelial or Reticular System. 22. Diseases of the Alimentary Canal. Section I.—Diseases of the Mouth and Throat. Section II.—Diseases of the Oesophagus. Section III.—Diseases of the Stomach. Section IV.—Diseases of the Intestines. 23. Diseases of the Liver. 24. Diseases of the Pancreas. 25. Diseases of the Ductless Glands—The Endocrine Disorders. 26. Diseases of the Urinary System. 27. Diseases of the Reproductive System. 28. Diseases of the Breast. 29. Diseases of the Nervous System. Section I.—Introductory Notes. Section II.—The Cerebrospinal Fluid. Section III.—Diseases of the Membranes and Ventricles. Section IV.—Tuberculous Disease of the Central Nervous System: and Acute Lymphocytic Choriomeningitis. Section V.—Syphilitic Disease of the Nervous System. Section VI.—Other Pathological Changes occurring in the Lymphomeninges. Section VII.—Injuries to the Neuraxis. Section VIII.—Circulatory Disturbances of the Neuraxis. Section IX.—Inflammation of the Brain. Section X.—Congenital and Developmental Abnormalities of the Neuraxis. Section XI.—The Nervous System in Metabolic and Deficiency-Diseases. Section XII.—Certain Degenerative Diseases of the Brain. Section XIII.—Tumours of the Nervous System. Section XIV.—Animal Parasites in the Central Nervous System. Section XV.—Demyelinating Diseases. Section XVI.—Diseases of the Spinal Cord and its Membranes. Section XVII.—Diseases of Peripheral Nerves. Section XVIII.—Morbid Changes in the Autonomic Nervous System. 30. Diseases of the Bones. Appendix (Additional Notes). Index. Errata and Corrigenda.

This textbook of pathology occupies a unique position. It is undoubtedly a work of universal importance, and we can agree with the editor and the publishers that neither time nor expense have been spared in making this a work in a class by itself. It is volumes such as these which make us increasingly aware of the need to discard the mediaeval practice of notetaking in the medical schools.

With such an authoritative guide the student can discover, with a little effort on his part, the true perspectives of pathological processes in relation to his clinical problems.

The volumes are magnificently produced and illustrated, and, apart from their utility to the medical undergraduate, the volumes should serve a most useful purpose on the shelf of every practising physician or surgeon.

CORRESPONDENCE

INTERNATIONAL SEROLOGY CONFERENCE

To the Editor: I have the honour to refer to the resolution passed by the Executive Board at its fifth session requesting the Director-General, among other activities, 'to draw the attention of Member Governments to . . . the holding of the international serology conference, approved by the Health Assembly, and to facilitate the arrangements for this conference in every way possible'.

I am glad to inform you that preparations for this conference, to be held late in 1951 or early in 1952, are now under way on the basis of the recommendations of the Sub-Committee on Serology and Laboratory Aspects, as approved by the Executive Board. A laboratory expert has recently been appointed by Headquarters for the purpose of preparing and directing the conference.

I should be grateful if you would kindly extend preliminary invitations for participation in the conference to important test-authors of serodiagnostic tests for syphilis in your country. Applications should be received by WHO not later than 15 July 1950.

The final outline of the conference, the site and the details of the programme will be made available following the scheduled meeting of the WHO Sub-Committee on Serology and Laboratory Aspects in September this year.

Martha M. Eliot, M.D.,

World Health Organization, Acting Director-General,
Palais des Nations,
Geneva,
30 March 1950.

THE RESTORATION OF HEARING AND COPYRIGHT RESTRICTIONS

To the Editor: After a discussion with Prof. W. E. Underwood it is with the utmost reluctance that I find myself obliged to inform you that the publication of the article *The Restoration of Hearing in Chronic Middle Ear Suppuration* in your issue of 25 March was unauthorized. No permission to report this work was sought from the Department of Surgery of the University of the Witwatersrand or from me. It would have been refused for reasons which will be made clear in this letter.

Wherever research is conducted happily the risk of infringement of priority is negligible nowadays. Every facility is given to those interested including confidential advance papers. Publication rules, however, are rigid.

For over five years it has been my privilege to conduct the research on restoration of hearing by the transtympanic method. (It may be of interest that the term 'transtympanic' coined by the writer to distinguish the direct surgical approach to tympanic structures from the orthodox posterior exposure through the mastoid has passed into the international vocabulary of otology.) I presented this work at the Fourth International Congress of Otolaryngology in London in July 1949. The title of this paper was *The Restoration of Hearing in Surgery of the Chronic Ear*. Over 400 advance copies of this paper were distributed by the Department of Surgery, University of the Witwatersrand. Each copy was numbered with the following legend:—

'From the Department of Surgery, University of the Witwatersrand, Johannesburg. (This communication is confidential and copyright.) To be presented at the Fourth International Congress of Otolaryngology, London, 18 to 23 July 1949.'

These copies were made available to otologists in South Africa, Europe and America. Many of them have since communicated with me reporting a series of operated cases, notably Jongkees of Utrecht and Scandinavian otologists. All, with the exception of your contributor, have observed the restrictions as regards publication or have deferred this for obvious reasons.

Firstly, it is customary for the main paper to appear in print before subsidiary papers based on this work are published by other workers, who have followed this technique and added their experience, suggestions and modifications.

Secondly, as the main paper was presented at the London Congress its copyright is vested with the 'Proceedings' of that Congress.

Although we welcome records and papers on this research conducted in the Department of Surgery, your publication has caused us the greatest embarrassment and may also seriously compromise the copyright position.

The article in your *Journal* conveys the impression that its writer had contributed to the investigation. But for the copyright position we would have ignored the manner in which the article in question was published. As a result of your publication under the almost identical title *The Restoration of Hearing in Chronic Middle Ear Suppuration* my paper may not appear in the 'Proceedings'. Some material from this paper has been used and therefore would anticipate the *Proceedings of the Fourth International Congress of Otolaryngology* which is due to appear next July.

The injunction that the advance information was confidential and copyright has been meticulously observed overseas. You were not aware of any irregularity and are blameless. It is usual to consult a chief before publishing any papers relative to his work. The usefulness of this custom is emphasized by this incident.

O. Popper,

Senior Surgeon, Johannesburg Hospital.

Department of Surgery,
University of the Witwatersrand.
30 March 1950.

CRIMINAL ABORTION AND ITS PENALTIES

To the Editor: In a recent 'abortion appeal case' two of our eminent Judges found that the magistrate's sentence had been 'harsh in the extreme', and reduced the sentence from four months' hard labour to one of a fine of £30 or one month's imprisonment.

The sentence of four months' imprisonment does not appear to me to be harsh, judging by sentences in other similar cases, but what astounded me were the reasons given as 'mitigating features'.

Quoting from press reports: 'The first feature of the case which the magistrate should have considered, was that the woman was not married, and if she had allowed the pregnancy to run its full course, she would have had an illegitimate child. This would not only have brought disgrace upon the woman but it would have brought into the world a child stamped with illegitimacy for the rest of its life.'

In plain language, the law is partially condoning abortion in such cases, and such cases comprise the great majority of women seeking illegal abortion.

What is to be the attitude of the Medical Association in this matter?

The second 'mitigating feature' cited by our learned Judges was 'that the appellant took no payment'. That appears to me to be equally against the concepts of medical practice.

One can almost envisage a doctor's name plate of the future: 'Abortion specialist for unmarried women. No fees taken, but a donation for the furtherance of the prevention of birth of illegitimate children, will be esteemed a favour.'

I am of the opinion that this ruling of the Supreme Court will require careful consideration by the Medical Association and by the Medical Council.

G. F. Fisser.

'Little Manor,'
Katberg, C.P.
10 April 1950.

UNDESIRABILITY OF IMPORT CONTROL FOR MEDICAL SUPPLIES

To the Editor: Now that our Minister of Economic Affairs has seen fit to allow the importation of non-essential goods such as ladies' dress materials, I wonder if the Medical Advisory Committee would agitate for relaxation of some of the irksome restrictions to which the medical practitioners have been subjected in the last few months.

Diagnostic sera (sent to me by such authorities as the Ministry of Health and the Medical Research Council of Great Britain) have been subjected to numerous delays in our Post Office due to the severity of the import control regulations.

Materials for essential therapeutic use, such as immunization, treatment of thrombosis and certain diabetic foods, have all been subjected to similar restrictions.

Was it the Minister's *bona fide* intention to subject essential laboratory and therapeutic materials to severe control?

I am fully aware of the fact that permits can be obtained, but this may take up to two months before details can be completed.

May I suggest our Parliamentary Medical Committee draw the attention of our colleague, the Minister of Health, to the severity of the regulations now in force, particularly in so far as it affects the individual practitioner importing small quantities of material for his own *bona fide* use.

'Pulseless'

14 April 1950

MEDICAL TREATMENT OF CRIMINALS

To the Editor: There appeared in the local press a commentary on your editorial on the prevention and treatment of crime. As a student for over 35 years of penology and criminology (embracing criminal psychology and sociology), I was particularly interested in your conclusion that only by co-ordinated work of sociologists, economists, psychologists, lawyers and psychiatrists can a rational system be devised.

Some 20 years ago I addressed to the University of the Witwatersrand a monograph advocating co-ordination between doctors, lawyers, economists, social workers and the Government Departments of Statistics and Prisons, with the same end in view. At that time there was no Chair of Forensic Medicine at the University, and doubtlessly my memorandum was filed and forgotten.

I feel with you that a start should be made to crystallize your suggestion and bring into being a Medico-Legal Committee to devise ways and means of giving practical form to the scheme. May I suggest that your profession is best suited to give a lead by convening a meeting of all interested persons and bodies, including a representative from the Penal Reform League of South Africa.

It may interest you and your readers to note that a recently published book, *The Show of Violence*, is most informative on the subject. The author, Dr. Fredric Wertham, one of the foremost psychiatrists in America, is head of the Mental Hygiene Clinic at Queen's General Hospital, president of the Association for the Advancement of Psychotherapy, and head of the famous Lafargue Clinic in Harlem.

Two extracts from Dr. Wertham's book indicate that he holds the same views as you:

'The administration of justice is a complex phenomenon based on moral, legal, political, administrative and sociological norms which are not static but have a historical development. Psychiatry and jurisprudence must be the parts of a planned social response to an individual anti-social reaction.'

From this point of view punishment has three aspects: the protection of society, the re-education of the delinquent, and what my studies have revealed as a neglected but important factor, the condemnation of the crime.'

Speaking of Counsel for the prosecution and defence, he says:

'It often occurred to me during that period how wonderful a society could be—and I am convinced will be—when two outstanding men will fight not on opposite sides but on the same side; or, better still, when there will be no sides at all, but one society whose interests are reflected in the interests of each of its component individuals. Working with such a team, how much a psychiatrist could accomplish (which he cannot do now) in the prevention of individual violence and in the reclaiming of potentially valuable personalities!'

Permanent Buildings,
Commissioner St.,
Johannesburg.
20 April 1950.

Gus. Av. Friendly.

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